The Air Line Pilot

September, 1952

Air Travel---Going Up

Two Phonetic Alphabets

Robert G. Strait

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"SEE YOU AT THE POLLS!"

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Nobody knows for sure how it started—this line about "See you at the Polls!" we're hearing all over these days.

Best explanation seems to be that it came from that state candidate out west. . . . His opponent in a debate got all riled up and challenged him to fight it out in the alley.

But he said—"I'll settle this the AMERICAN way—I'll see you at the polls!" And the audience picked up the chant.

Now everybody's saying it—and on Nov. 4 everybody will be *doing* it!

"SEE YOU AT THE POLLS!"

"SEE YOU AT THE POLLS!"

Two Phonetic Alphabets

World's air line pilots want the old, ICAO wants the new. Most Nations, including the U. S., ride the fence.

Early in 1952 the CAA ordered the new phonetic alphabet (Box), adopted by the International Civil Aviation Organization, put into use in U. S. ground stations. The action came in spite of the fact that the world's air line pilots (through IFALPA) had notified the agency that they were opposed to use of the new wording and would retain the old. Said IFALPA: ". . . our membership is being advised that the former alphabet will be retained until a satisfactory revision is available . . ."

Since then, the air line pilots have been joined in their opposition by other organizations. To CAA, the Aircraft Owners and Pilots Association said: ". . . the new alphabet, adopted in the interest of safety and clarity has exactly the opposite effect . . ."

Result: CAA was sorry that the pilots found fault with the new alphabet, but it went into effect anyway.

On Paper the ICAO alphabet appeared logical; chiefly because of aims expressed by ICAO when it invited itself to take up the task of re-designing the phonetic alphabet. The group said it was seeking words which:

—Could easily be pronounced and understood by airmen of all countries . . .

—Had good radio transmission and readability characteristics, regardless of noise or static, and

—Were "live" words in each of the three principle languages, English, French, and Spanish.

But ICAO's word and deed had little in common. Instead of creating clarity in air-ground communications, the revised alphabet brought on confusion and a slow down in message transmission.

ICAO's alphabet represents a compromise and as often results from attempted compromises of technical problems, the end product pleases no one and is impractical. Indications are that few countries actually favor the new alphabet but are compromising in an attempt to win acceptance of a standard through ICAO. The difficulty is that aviation authorities of member nations of ICAO made little or no attempt to determine whether their product had "user acceptance" before attempting to impose it.

The Pilots' Fault-Finding with ICAO's alphabet has not been without reason. In a letter to their government, Dutch pilots got down to cases:

—A Lack of Clarity. The new alphabet contains a majority of words which end in "a" or "ar" combinations. Both have a tendency to come out "ah" to the pilot. As a result, these words must be recognized by their first syllables, slicing in half the possibility of recognizing the word correctly. Examples: Alfa, Coca, Delta, India, Lima, Nectar, Oscar, Papa, Sierra, Extra.

Some of the words are soft sounding —Alfa, India, Sierra—and over static are easily confused with such natural sounds as a sneeze or cough.

A great many of the words end in "o"—Bravo, Echo, Kilo, Metro, Romeo—again placing the burden of recognition on the first syllable.

—Doubtful Common Usage. One of ICAO's main arguments for a new alphabet was an insistence that the old (Box) contained words not in common usage in all countries (a claim never substantiated). But the new alphabet is shot through with words which are foreign to the English language. Examples: Alfa, Bravo, Julliet, Kilo, Lima, Metro, Sierra, Romeo, Zulu. A phonetic alphabet, say the pilots, becomes a separate language, and through constant use, the words of the old alphabet have achieved common usage; at least for pilots, the principal users.

—The time of message transmission was increased using the new alphabet due to ICAO's choice of words containing more syllables. The pilots' and

(Continued on Page 15)

The Old		The New	
Able	Nan	Alfa	Nectar
Baker	Oboe	Bravo	Oscar
Charlie	Peter	Coca	Papa
Dog	Queen	Delta	Quebec
Easy	Roger	Echo	Romeo
Fox	Sugar	Foxtrot	Sierra
George	Tare	Golf	Tango
How	Uncle	Hotel	Union
Item	Victor	India	Victor
Jig	William	Julliet	Whiskey
King	Xray	Kilo	Extra
Love	Yoke	Lima	Yankee
Mike	Zebra	Metro	Zulu

The Air Line Pilot

September, 1952

Published Monthly by The Air Line Pilots Association, International, Affiliated with A. F. of L. Editorial offices: 55th Street and Cicero Avenue, Chicago 38, Illinois.

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Entered as Second Class Matter March 11, 1933, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.
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Annual Subscription, $2.50

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W. Johnston, Editor

Operating the Comet

Reprinted from *Shell Aviation News*

The story of the Comet's development from the design stage up to the present proud moment when it is taking its place as the first jet airliner to go into service on the international air routes has been one of closest co-operation between the manufacturers, de Havilland, and their first Comet customer, BOAC.

This aircraft, representing a major step forward in civil aviation, was designed from the outset for use by long-range operators and in particular by BOAC, whose requirements have been studied at every stage. In fact, BOAC formed their Comet Development Unit to study the operational capabilities of the aircraft immediately after the second prototype Comet flew, and this aircraft was loaned to BOAC soon after it was completed so that they could expedite crew training and flight trials both at home and abroad. This permitted BOAC to begin their development programme very much earlier than would otherwise have been possible.

The months since the second prototype was received on loan have been spent in training air crews and ground handling crews at stations on the routes to Johannesburg and Singapore, and in examining how the Comet will fit into the traffic pattern to which the conventional aircraft using the busy airports conform. All the airports that will be used for the scheduled Comet services have been visited—including diversionary airports for each of the scheduled stops on the route—to check the take-off performance of the aircraft under existing local conditions.

In the operation of a commercial aircraft propelled by the thrust of jet engines, one factor, its exceptionally high fuel consumption per hour, governs every phase of its operation. The fuel consumption of the Comet per hour, for instance, is around three times that of present day conventional piston-engine airliners of comparable size, and the narrow r.p.m./thrust relationship adds a further complication by denying it the ability to hold in an airport terminal traffic "queue" at the low engine speeds and low fuel consumption per hour which can be achieved by piston-engine aircraft.

To make the operation of such an aircraft an economic proposition, therefore, everything possible is done to offset the inevitably high fuel consumption. The aircraft is flown at as great a height as possible so that with the reduced drag at altitude the greatest number of air miles can be covered for a given amount of fuel used, and at the highest possible speed. Thus with the Comet distances are covered in about half the time taken by a conventional airliner and this advantage is used to make the aircraft fly more journeys in a given time and so increase the total revenue earned.

This increased rate of working influences every phase of its operation on the ground as well as in the air and the economic success of the Comet depends on the cooperation of everyone concerned with it, from the ground

By D. O. MacDougall

handling and loading personnel, the fuelling crews, the traffic controllers and meteorologists and Customs officers to the flying crews themselves. The time spent on the ground at fuelling stops must be cut to the minimum if the high speed of the aircraft is to be fully utilized.

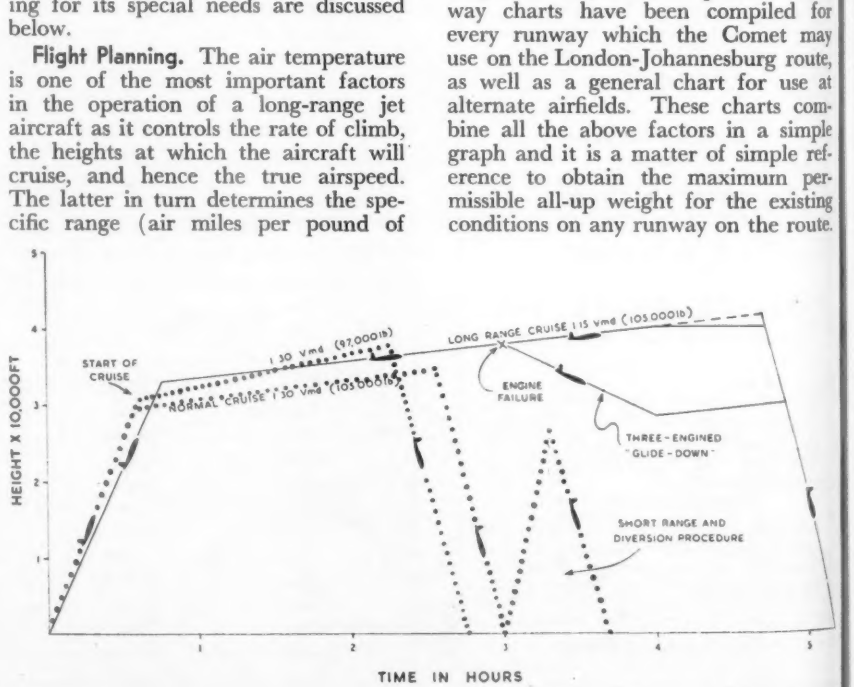
Some of the various sections of the work of operating the Comet and catering for its special needs are discussed below.

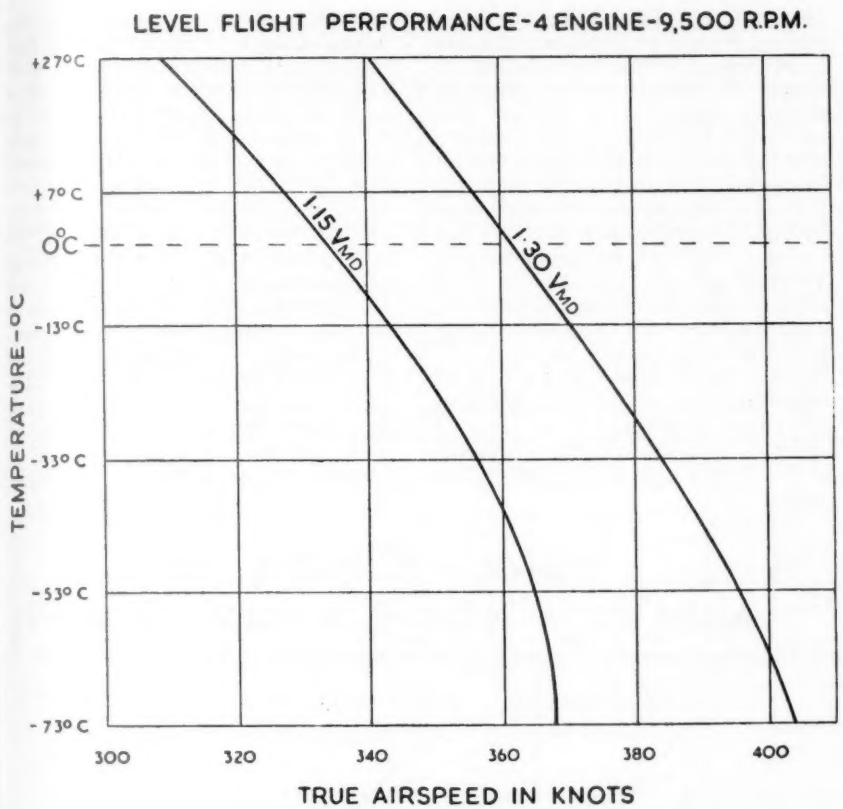
Flight Planning. The air temperature is one of the most important factors in the operation of a long-range jet aircraft as it controls the rate of climb, the heights at which the aircraft will cruise, and hence the true airspeed. The latter in turn determines the specific range (air miles per pound of fuel) since, within limits, fuel consumption per hour at the normal cruising altitude does not vary much. It can be seen therefore that air temperature controls the choice of flight path, largely determines the fuel load carried, and governs the whole economy of the operation.

The effect of air temperatures on Comet operations can be illustrated by the fact that a 10°C. rise in temperature reduces the cruising altitude by 2,000 ft., the true airspeed by 13 knots, and the cruising range by 2%.

Working out the flight plan on the basis of the meteorological forecast of temperatures and winds at various altitudes and arriving at the fuel load to be carried has to be done within a matter of minutes of arrival at a transit station if costly delays are not to occur. This calculation has been simplified into tabular form from which the fuel consumption on the climb, cruise and descent portions of the flight can be extracted quickly. Before this can be done, however, the all-up weight at which the aircraft will takeoff and climb under the existing conditions and with the performance required by ICAO has to be established, since the fuel requirements for any flight depend on the all-up weight.

For the Series I Comet the maximum take-off weight is 105,000 lb., but this is reduced under certain conditions by such factors as ambient air temperature, runway length, gradient, and type of surface, airport altitude, and, of course, wind component. Runway charts have been compiled for every runway which the Comet may use on the London-Johannesburg route, as well as a general chart for use at alternate airfields. These charts combine all the above factors in a simple graph and it is a matter of simple reference to obtain the maximum permissible all-up weight for the existing conditions on any runway on the route.





In calculating the fuel load, account is taken of the amounts used in starting, taxying and take-off, and the climb, cruising and descent sections of the flight, together with the amounts needed to take the aircraft to the furthest alternate airfield from a point 1,000 ft. above the destination with sufficient fuel to allow it to wait there for a limited period before landing. To all of this a further 10% is added as a safety margin.

Without going into fuel consumption calculations in detail, a few approximate figures for the different stages of the flight may be interesting. For example, 65 lb. fuel per minute (8 I.G./minute) are used during starting up and taxying. Take-off and acceleration to 260 knots for weights above 95,000 lb. uses an average of 900 lb. (114 I.G.). On the climb to cruising altitude around 8,600 lb. (1,075 I.G.) of fuel are burned and cruising at maximum economy uses 6,400 lb. per hour (800 I.G./hr.) which decreases towards the end of cruise to around 5,300 lb. per hour (662 I.G./hr.). Descent from 40,000 ft. to circuit height with the inboard engines throttled back takes about 35 minutes and uses 2,300 lb. (288 I.G.) of fuel.

The Flight Pattern. From take-off the Comet is climbed at a constant engine speed of 9,750 r.p.m. at an initial indicated airspeed at sea-level of 260 knots which is reduced by two knots every 1,000 ft. until cruising altitude is reached. This initial cruising altitude varies around 32,000 ft. depending upon the take-off weight of the aircraft and the air temperature, and takes about 35 minutes to reach. In practice the pilot continues his climb to a height several hundred feet above the initial cruising altitude and descends to his cruising height in a slight dive before setting up his constant cruising engine speed of 9,500 r.p.m. In so doing he quickly builds up his speed to the figure required for cruising.

Two cruising procedures are used for the Comet. These both involve flying at constant lift coefficient, or in other words at a fixed percentage above the minimum drag speed.

Long-range (High Altitude) Cruise Procedure. In this the aircraft is flown throughout the cruise at 1.15 times the minimum drag speed (or 1.15 Vmd.). This gives very nearly maximum fuel economy (see specific range curve, page 3) and is therefore the procedure used for long-range cruising for stage lengths of up to 1,750 nautical miles.

"Normal" Procedure. Here a rather faster speed (1.30 Vdm.) is used for shorter stage lengths around 1,000 nautical miles. For the same take-off weight cruising is commenced at a slightly lower altitude and throughout the flight altitude remain less than in the first case. Indicated and true airspeeds during the cruise are both slightly higher and the latter largely offsets the higher fuel consumption, resulting in only a small loss in specific range while leading to shorter flight times and higher utilization.

Both cruising procedures simply consist of setting up a constant engine speed and then flying at specified indicated airspeeds which are reduced every half hour as the aircraft weight decreases with consumption of fuel. Due to the reduction in weight and airspeed the aircraft climbs slowly during the cruise at about 40 ft./min. It can be seen that 40,000 ft. is only reached towards the end of the cruise, if in fact it is reached at all, and that during this period the aircraft slowly ascends some 8,000-10,000 ft.

It is interesting to note that the technique of long-range flying differs from that on piston-engine aircraft in that with the Comet the pilot controls the airspeed and allows the aircraft to find its natural height, whereas with piston-engine aircraft the pilot normally flies the aircraft at a selected altitude. The particular airspeed at which the Comet is flown varies with the outside air temperature and this

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causes further slight variations of height. Using this technique the pilot has to accept the winds encountered and makes no alteration of height to avoid adverse wind conditions.

One noticeable feature in aircraft flown at high true airspeeds at high altitudes is the relatively low indicated airspeeds at which the aircraft travels. On the cruise the Comet's airspeed indicator may, for example, register only 210 knots, but corrections for height and the very low outside air temperature can bring this up to 390 knots true airspeed or 455 statute miles per hour.

Descents from cruising altitudes are normally made without the use of airbrakes at 220 knots indicated airspeed and with the inboard engines throttled back to a jet pipe temperature of 200°C. The speed of the outboard engines has to be kept fairly high in order to maintain the pressurization of the cabin, since compressed air for this

purpose is bled from the four engine compressors. Under these conditions the rate of descent at the end of a flight is about 1,100 ft./min.

The airbrakes are used to increase the drag and so slow down the aircraft. They are therefore employed to reduce speed quickly when entering areas of turbulence and their use is a normal feature of all flights for increasing the rate of descent to the terminal airport or a position in a "stack" without corresponding increases in airspeed. They can be used at any speed and the effect felt in the cabin is that of a sudden slight deceleration without change of altitude. Airbrakes are also used for emergency descents. With the airbrakes out and all engines throttled back to 6,000 r.p.m. rates of descent up to 6,000 ft/min. can be achieved without exceeding the critical Mach Number.

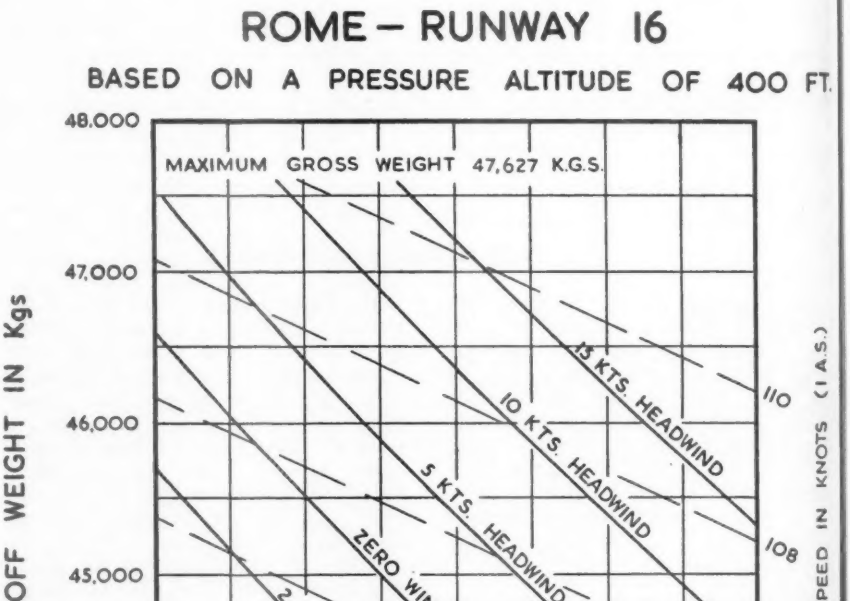
Even for short flights of the order of 100-400 miles the most economic procedure with the Comet is to climb as normally to the point of descent and then carry out a normal descent at 220 knots IAS with inboard engines throttled back. In this there is therefore no cruise portion of the flight.

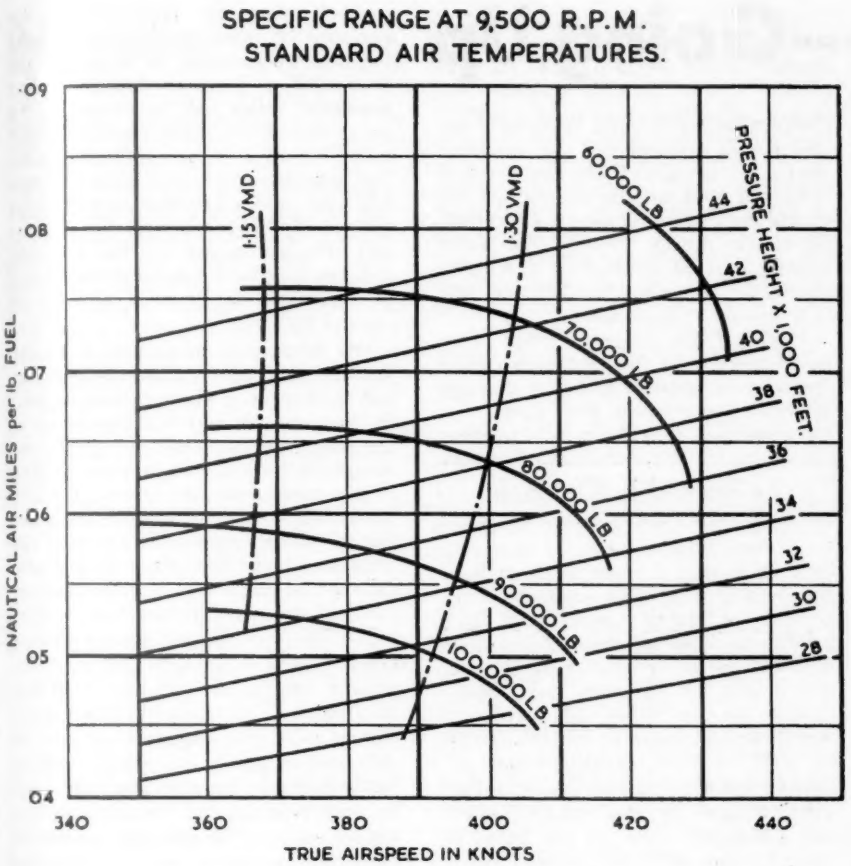
Three-engine Cruise. Comparison of the stabilized performance on three and four engines (at 1.15 Vmd.) shows that on three engines the speed is reduced by approximately 70 knots TAS (20%) and the specific range by 25%. This is based on the height which aircraft can maintain on three engines (running at 9,500 r.p.m.) at the same weight. However, if an engine fails in cruising flight the aircraft will be about 12,000 ft. higher than the stabilized three-engine height.

Since its performance deteriorates appreciably with decrease in altitude the loss in performance can be minimized by flying the aircraft at 9,500 r.p.m. at airspeeds of 1.15 Vmd. and so stretching the glide that the descent to three-engine height takes about one hour. After the aircraft has reached its stabilized height the cruising height will again gradually increase as fuel is consumed. In this way the performance can be so maintained that on a 1,500-mile flight, for example, only 20% of the reserve fuel is used in continuing on three engines after an engine failure at cruising altitude beyond the point of no return.

Holding Procedure. The lower the altitude the higher is the Comet's fuel consumption per hour and this is also true for holding when gallons per hour and not air miles per gallon become important. For this the aircraft is flown at the minimum drag speed of 180 knots IAS by throttling back the inboard engines and adjusting the outboard engines to give the required airspeed. At altitudes below 15,000 ft. this uses roughly 100 lb. fuel per minute or 750 I.G./hour. Holding is therefore carried out at as high an altitude as possible both to minimize fuel consumption and to avoid having to climb back to altitude again should a holding period be followed by diversion to an alternate airfield. Any form of climb after an unnecessary descent, even to a position in a stack, constitutes a dangerous waste of fuel and for this reason BOAC's Comet crews do not descend below 25,000 ft. until it is known definitely that the weather at the terminal airport is fit for landing and the point of descent has been established beyond doubt.

In-flight Activity. At present the BOAC Comet carries a crew of four consisting of two pilots (captain and first officer), a flight engineer and a radio operator, as well, of course, as a steward and stewardess. No navigator as such is carried. The captain flies the aircraft and during the critical low altitude stages of take-off and landing the first officer assists him with the R/T, in setting up the required engine conditions, and in keeping a look out for other aircraft. The first officer is also the navigator but as the navigational routine is all planned in detail in advance and the real work of navigation does not begin until the top of the climb, this gives him plenty of time both to assist the captain and to navigate. Likewise the job of navigating the aircraft really finishes at the





start of the descent when the aircraft is only thirty-five minutes from its destination and the last part of the journey is purely a matter of homing on to the terminal airport by the use of one of the various approach aids such as the radio compass or the responder-radar equipment.

In flight the engineer keeps a log of all engine instrument readings and watches the functioning of the automatic cabin pressure control mechanism. At regular intervals he integrates the total weight of fuel consumed from the fuel flow meter readings cross-checked by the tank contents gauges. This repeated calculation occupies most of the engineer's time but is a vital part of the flight work for from it he derives the aircraft's current weight which is used by the navigator in checking the progress of the flight. It also gives a continually revised figure for the fuel reserve expected at the end of the flight. During the climb these calculations are made every ten minutes and on the cruise and descent the weight of the aircraft is calculated every thirty minutes.

The need for a radio officer really arises from the fact that the range of R/T communication is so limited (around 150 miles), the spacing of VHF ground stations on parts of its routes so far apart, and inter-station communication so delayed that BOAC have selected W/T as their main means of transmission in order to be able to communicate direct with their destination at an early stage in the flight. By this means they can receive continuously such information as weather conditions for landing at both destination and alternates and the expected congestion in air traffic at their estimated time of arrival. The BOAC Comets have also received permission to overfly certain Air Traffic Control Zones in Europe without clearing their flight through on R/T as do aircraft flying at lower altitudes because, due to the heights at which the Comet flies, its VHF R/T transmission is received and answered by several stations operating on the same frequency with resulting confusion.

It is, however, planned that when VHF station coverage is eventually improved along the route, VHF R/T will become the main method of communication and a radio operator will no longer be carried. BOAC also plan to reduce the crew of the Comet finally to three men, all of whom will be pilots, if experience shows that this can be done. These, however, are long-term plans and at present both flight engineer and radio operator are very necessary.

Navigation. The navigation techniques used on the Comet are exactly similar to those used on other aircraft, but because of the shorter times taken in covering the same distances the navigator's in-flight activities have to be planned beforehand to enable him to make the same number of navigational checks in the shorter time.

The navigator therefore studies the route in advance and plans his navigation work in detail taking each sector in turn and deciding upon its value in providing navigational aids. For example, radio beacons to be used for position fixing are selected, plotted on his chart and even position lines may be drawn with approximate times of passing so that the taking of a bearing can become merely one of observing the exact time when the automatic direction-finding radio compass needle reaches the pre-drawn bearing.

Strangely enough for an aircraft travelling at such a speed astro-navigation is also used for position fixing in areas poorly supplied with radio-navigation aids. Here again, as much of the work as possible is done on the ground beforehand, the shots being precomputed from astro tables, so that the work in the air becomes little more than that of taking the shot with a periscopic averaging sextant at the correct time and plotting the bearings.

As already indicated, the navigation really begins with the fixing of the aircraft's position at the top of the climb, its track up to that point being controlled by the pilot using back-bearings

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on the ADF radio compass. It is at this point that the real work of the flight begins, for besides carrying out the pure navigation the first officer is also responsible for checking the changing weight of the aircraft against its height and outside air temperature and extracting from performance tables the appropriate indicated airspeed to maintain the chosen lift coefficient. These airspeeds are passed to the captain to fly, usually at half-hourly intervals.

Success in operating the Comet depends on flying it as closely as possible to a predetermined set of conditions and to achieve this the engineer and first officer work closely together throughout the flight, repeatedly cal-

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Air Travel---Going Up

By Ronald L. Oakman

One of the few certainties encountered in life today is the certainty that we will have change. Statisticians attempting to chart the future course of events frequently miss but their efforts are deserving and often give us cause for reflection as we rush about changing their carefully established trend lines.

A Year Ago in these columns, we published a partial reprint of a forecast made by the New York Port Authority concerning the future of air transportation which indicated that by 1980 the domestic air lines of the United States would be producing over 22 billion passenger miles a year. This forecast was made in June of 1950 (In 1950, 6.6 billion passenger miles were produced.) and though it was practically correct in telling us what the air travel would be for the remainder of that year, the totals which they predicted would be reached by 1955 (11,066,000,000 passenger miles) will have been exceeded already by the end of 1952. (11,600,000,000 passenger miles forecast by ATA.)

Similarly, the CAA made a forecast in 1945 in which they predicted 20,000,000 air passengers for the year 1955. Here, too, the totals for the year 1952 will exceed this 1955 prediction (22,300,000 now expected). This CAA prophecy was more accurate than it may seem, however, for appended to it was the statement, "On the whole the CAA feels that its predictions of air carrier operations expansion are so conservative that they may be realized in five or six years instead of ten"—this makes it accurate indeed.

In August of this year, the CAA released a further study of the future in which they predicted 40,000,000 passengers on the nation's air lines by the year 1960. The chart here reproduced illustrates the basis for this claim. This chart shows two estimates. Trend line A is a projection based on the rate of growth between 1946 and 1950 which may be called peace time years. This base eliminates the spectacular growth made during 1951. "Even if only this rate of growth is maintained," the CAA states, "there should be approximately 35,400,000 air line passengers during 1960." The projection in line B is based on the inclusion of the air passenger traffic for the year 1951, despite certain inflationary effects caused by the Korean situation, and concerning this the CAA says, "This approach is valid in terms of the anticipated growth of the economy during the decade. If the rate between 1945 and 1951 will be maintained, we should have approximately 43,000,000 passengers during 1960." The CAA believes that the estimate of 40,000,000 annual air passengers by the year 1960 is reasonably conservative.

If this CAA prognostication were based merely on the extension of the trend line as gleaned from the charting of the years between 1945 and 1951, we would say that their 1960 forecast was indeed tenuous. For it can hardly be argued that a short span such as this would necessarily indicate, with accuracy, a long time trend. The CAA informs us, however, that this estimate is based on much more solid ground, taking into consideration such fundamentals as the growth of population which they estimate to be 169,000,000 by 1960. They estimate annual national income to be 385 billion dollars (1949 dollars) by 1960 and total inter-city passenger miles for all forms of transportation to be 577 billion. At the time this forecast was made by the CAA the total air line passenger miles constituted only 2.2 per cent of all inter-city passenger miles and only 4.4 per cent of inter-city passenger miles for trips longer than 50 miles. In the year 1960, it is assumed that air line passenger miles will approximate 6.6 per cent of all inter-city passenger miles for trips longer than 50 miles, and since they anticipate that between 200 and 300 additional communities will be eligible for air carrier airports and offer air service by that time the average length of passenger travel will be somewhat less than it is today or around 450 miles.

We Wish that the future indicated just such a climb in pilot employment, but as they say, "History is prologue," so, looking at what has happened in the past, we can only go on the assumption that no such increase in pilot employment will take place. In fact, 1951 is the first year in which the number of pilots employed surpassed the total for 1946. We have long maintained that the slump in pilot employment in the years immediately following 1946 was due to an over-sized dose of new technology but even assuming for the moment that 1946 was an "unusual" year the future expansion of pilot jobs, especially in view of the type of equipment which will be forthcoming in the next few years, will be very gradual and sporadic, slumping somewhat with the introduction of each new group of more productive aircraft. Nevertheless, should there be no expansion whatsoever in the num-

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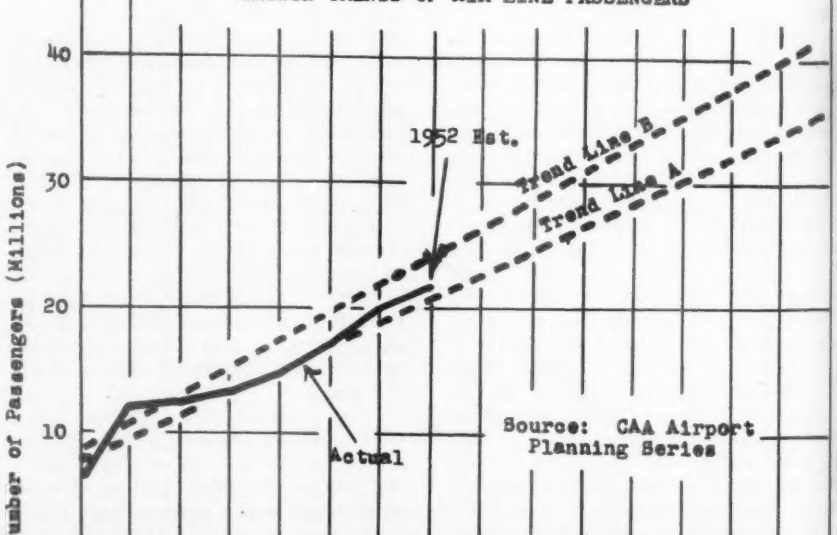

News

Doolittle Report Gets Truman Nod

President Truman has ordered government agencies to begin carrying out recommendations of the Doolittle Report (Air Line Pilot, June). The directive was issued to Secretary of Defense Robert Lovett, Secretary of Commerce Charles Sawyer, CAB Chairman Donald Nyrop, and Postmaster General Jesse Donaldson. The quartet was asked to examine the recommendations for the purpose of immediately affecting some projects, and effecting some in due course.

The agencies were also asked to consult with state and local governments and interested industry groups in the process of implementing the recommendations.

Ryan on Mergers

CAB Vice-Chairman Oswald Ryan warned recently of "inherent dangers that must be carefully guarded against" in merging airlines. He urged specifically against considering mergers as cures for the economic ills of the airline industry.

Commented Ryan: "The idea that merely putting two weak carriers together by means of merger will inevitably produce a strong air carrier is not a valid assumption. Such a merger may in some cases be desirable. But in other cases it may result in a combined carrier that is equally weak or even weaker than the two were before the merger. Two minuses do not necessarily make a plus.

"Nor should we consider that equalizing the size and strength of air carriers is the practical or desirable objective of mergers. The reason why such a policy would not be sound is the simple fact that there is no direct and constant relation between the size of an airline and the economic efficiency of its operation."

CAB Eyes Non-Sked Operations

The Civil Aeronautics Board has opened an investigation into the operation of non-scheduled carriers. Principles in the proceedings are 66 non-scheduled carriers and 2 non-scheduled air carrier trade associations.

A number of the larger certificated carriers have intervened in the proceedings to protest against non-scheduled "coach" operations. The certificated carriers were joined in the protest by better business bureaus of three cities—Chicago, San Francisco, and Los Angeles. The bureaus say they have hundreds of complaints against the non-skeds for failure to make refunds for canceled flights.

Certificated Carriers Say: — Non-skeds are threatening the economic stability of air transportation because they concentrate their domestic operations on the stronger and more heavily traveled air routes of the U. S.

—Non-skeds have concentrated on the backbone routes in open defiance

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of CAB regulations by running daily schedules individually or through combines although CAB prohibits "frequent and regular operations.

—Non-skeds are offering unrestrained competition by invading lucrative air markets and assuming no responsibility for developing less profitable routes.

Non-skeds Reply:—it is they who have stimulated low-fare air coach service, bringing economical air travel to the public.

—They are independent" by which they mean they carry no mail and so receive no subsidy.

—They have begun a "self-policing" aimed at eliminating mistreatment of passengers.

Ditching Rules

An urgent project of ALPA for past months is about to bear fruit, new ditching rules are being proposed by CAB's Bureau of Safety Regulation. The Board has set September 29 as the deadline for comment by Industry. Principle reason for CAB's sudden hurry-up: 88 persons drowned in 1952's two airliner ditchings due to lack of pre-flight briefing and poor location of life-saving gear.

New Proposals:

Pilot representatives and the 5-pilot neutral panel which met September 11, 1952, to hear evidence and make recommendations for the integration of the seniority lists of West Coast and Empire pilots. Left to right are West Coast pilot representatives F. McDonald and J. Jobe; Panel members D. W. Ballard, Continental, J. T. Fredrickson, NWA, R. Pontius, Ozark, D. E. McKee, Cal Central, and V. Rowland, EAL; and Empire pilot representatives M. Smith and J. Wise.

-Rafts and lifevests will be CAA-approved and placed in positions easily accessible in case of a surprise ditching.
—Airlines will brief passengers with an actual demonstration of where and how to find vests and rafts and how to don vests.
—Doors and exits will be especially lighted. Lights will go on automatically if a crash comes. Luminous paint will mark door handles.

John Burn of PAA has been ALPA's principal spokesman on this project.

Convention

Article II, Section I of the Constitution and By-Laws of the Air Line Pilots Association provides as follows "The Conventions of the Association shall be held biennially beginning at 10 A.M. on the third Monday of October, provided that such date may be set by the President at any time within a period not to exceed sixty days prior to or later than the third Monday in October."

Article II, Section 3 provides: "Notice of Convention shall be sent to each Local Executive Council sixty days prior to the beginning date of a Convention, and notice thereof shall be published in the official magazine of the Association in two succeeding issues immediately prior to the beginning of a Convention."

This is your notice, as required by the By-Laws, that the 12th Convention of the Air Line Pilots Association will begin at 10:00 A.M. on the third Monday of October, or October 20, 1952, in Chicago, Illinois.

WCA-Empire Seniority List Integration

Pilots of West Coast and Empire met recently in an attempt to integrate the pilot seniority lists under ALPA machinery. Following 11th Convention procedure, representatives of both pilot groups presented their case to a 5-man Pilot Panel beginning September 8, 1952. The Panel presented its recommendations for integration of the seniority lists to President C. N. Sayen for transmission to pilot groups September 11, 1952.

The Recommendations:

—A point of origin from which to start integration of seniority lists is necessary.

VOTE

Robert G. Strait

On the front cover of this magazine is a photograph of Bob Strait. Bob, Treasurer of ALPA for the past four years, died late in the afternoon of Sunday, September 21 after a brief illness. We selected this picture of him, one of the latest taken, because we felt it portrayed him in a manner in which his friends will probably remember him. Whether flying or administering the Association affairs of his department, he took his time and thought things through. So, he was a man whom we respected.

Bob Strait was an honest man; not only with others but with himself. For that reason we will not attempt to gild him with meaningless phrases. He would not have tolerated it while he was living; he would not appreciate it now.

Bob Strait did not make rash judgments, but when he did decide upon a course, he was a strong fighter. He proved his rights to a fighter's laurels many times during the past months in his strong determination to strengthen the Association. We were proud to fight by his side.

Bob was never one to "let the other fellow do it." He was an ALPA worker. He was a former Master Chairman of TWA and a member of the old ALPA Central Executive Council. He was the Master Chairman of TWA during the difficult times of 1946. Bob Strait was on the first ALPA Air Safety Committee to work with an aircraft manufacturer in getting pilot recommendations into an airplane while it was still on the drawing board. He was a member of the ALPA group which inspected the Berlin Airlift. And he was on the committee which recently inspected the Pacific Airlift. He was completing the second term as the Association's Treasurer at the time of his death. He performed the Treasurer's duties in addition to flying a full schedule—devoting most of his leisure time and often exhausting his energies in the service of his fellow pilots. Bob Strait was a man whose contribution to the flying profession did not end when he stepped out of the cockpit. He gave, perhaps too generously, of his time and energy to causes in which he believed.

We will miss Bob Strait.

—Point of origin should be length of service.

—Using length of service as origin point, a uniform method of neutralizing gains and losses should be applied so that the individual pilot will not have to compromise length of service when comparing his relative position before integration to his position after integration.

—Steps in Panel's solution:

(1) Integrate the lists by straight length of service.

(2) Opposite each name on the list, compute the theoretical relative position of each pilot. Example: An Empire pilot is number nine (9) on a list of twenty-two (22) therefore he is number X on a list of forty-eight (48):

(3) Show gain or loss each pilot would sustain numerically in relation to this number as compared to a straight length of service list.

—The Panel applied a uniform correction to minimize the gains and losses, making sure that in no case did the correction leave a pilot with a less desirable position after integration than before.

It was the Panel's opinion that in any case a 50 per cent correction is the maximum which can be applied without a compromise on length of service. Recognizing that Empire and West Coast are of similar earning potential as applied to pilots, (identical equipment), the 50 percent correction was applied to 48 pilots. From No. 49 down, straight length of service was used, due to the fact that prior to the merger scheduled flight time was available to a minimum of 48 pilots. However, the recommendations were found unacceptable, the next step in the ALPA 11th Convention machinery—Arbitration — will begin before pilot groups and a neutral on October 6, 1952 at Seattle.

Flying the Comet...

(Continued from Page 7)

culating and cross-checking the aircraft's weight, using it to calculate the appropriate indicated airspeed, and finally comparing it with the expected value on a "How Goes It?" chart. The use of this type of chart is not new but the BOAC Comet crews find

it particularly useful in giving them a graphical impression of the progress of the flight at every stage.

The "How Goes It?" chart shows the change in the all-up weight of the aircraft caused by consumption of fuel against the distance flown. Before the flight the navigator draws the line that this is expected to take according to the flight plan and every thirty minutes during the flight he plots on the "How Goes It?" chart the actual all-up weight, derived from the engineer's calculations of weight of fuel used, and compares it with the estimated figure. Excessive consumption of fuel for a given distance covered drops the point below the expected line and means that the aircraft will arrive with less than the planned fuel reserve. By plotting two or three points the trend of fuel used against distance covered can be seen at a glance, the future position can be forecast by extra-polation and a decision made at an early stage. Also plotted on the chart are the three-engine onward flight and return flight lines which will allow the aircraft to arrive with the scheduled fuel reserve. The plot, of course, must never be allowed to fall below these.

The high degree of crew efficiency already achieved by BOAC in flying the Comet is the result of careful planning of the flight work and of following a rigid time schedule in the recurrent flight check calculations. Crew teamwork has been developed to a degree never before necessary in flying a commercial aircraft.

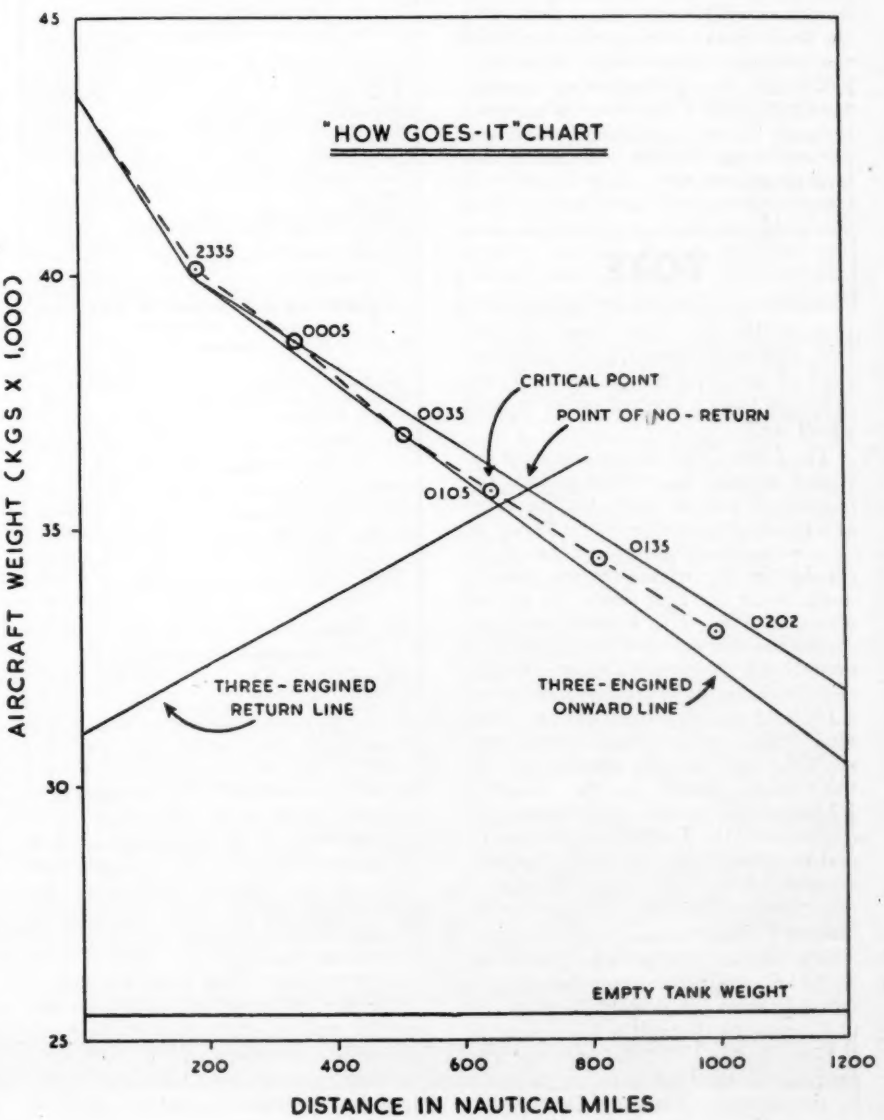
Radio. On the Comet two independent ADF radio compasses operating on the medium frequencies are used. The bearing indicator needles for these are mounted concentrically on the same dial on the pilot's instrument panel, while the navigator can select either set for indication on a large single needle dial set in the panel over his table. One of the sets is kept tuned in to stations lying either directly ahead or directly astern of the aircraft. This gives the pilot a fairly sensitive check on the track of the aircraft and gives early warning of large changes of drift due to a sudden change in wind. The second radio compass is used by the navigator for taking cross-bearings and the two together give an immediate two-position line fix.

Medium frequency radio aids such as the ADF radio compass are, however, affected by electrostatic discharges in the atmosphere and become useless for navigation under the conditions which occur, particularly in the tropics, at certain times of the year. This calls for the use of "static-free" radio navigation aids such as VHF D/F and responder-radar. Bearings can, of course, be taken on the aircraft's VHF voice transmission by VHF D/F ground stations, whilst the aircraft itself can obtain accurate distance indication by use of responder-radar in the form of "Rebecca" or the later type of distance-measuring equipment with which BOAC's Comets are being fitted.

Aircraft Handling Characteristics. Pilots who have switched from flying large piston-engine aircraft to the Comet find little difficulty in getting used to the feel of the spring-loaded, hydraulically operated flying control system after the manually operated linkage of the conventional type of control in which the aerodynamic forces on the control surfaces are felt in the forces on the control column. The Comet's control system is necessarily light in order to permit easy handling in the low-speed range, but it is equally light in feel at high speeds when the aerodynamic forces are high, and this point has to be remembered by the pilot.

Initial acceleration from rest is rather slow but the rate of acceleration increases markedly as the aircraft gathers speed, so that although the take-off run may be slightly longer at the maximum all-up weight, the initial climb characteristics are extremely good.

Opening up the engines to full power from idling has to be done fairly slowly and 10 seconds should be taken over this to avoid turbine blade burning and combustion chamber buckling.



There is, however, no such limitation on opening up to full throttle from speeds above 7,000 r.p.m. and so on the final approach the engines are kept at 7,500 r.p.m. at which the thrust produced is small. With the engines turning over at this speed power is immediately available should the aircraft tend to undershoot the runway. Only when it is positively certain that the aircraft will carry into the airport is the speed of the engines finally reduced to idling r.p.m. The approach is made at 125 knots IAS, the boundary is crossed at 105 knots and the touch down made at around 94 knots.

Fueling. The Series I Comet carries its aviation kerosine in five tanks, two outboard integral tanks each of 1,220 I.G. capacity, two inboard integral wing tanks each of 785 I.G. capacity, and a centre tank consisting of four interconnected rubber bags located in the lower part of the centre section of the fuselage. The centre tank holds 2,020 I.G., thus giving a total capacity of 6,030 I.G. The fuel is supplied through 2½ in. Lockheed Avery couplings on the fueling vehicles at one underwing refueling point under each wing, the centre tank being filled

VOTE

through the port side point. Electrically operated selector valves for fueling and defueling the various tanks are operated from a control panel in each wheel well.

The Comet fuel system has been designed to take up to 400 gallons per minute of fuel at each fueling point at a maximum pressure of 30 lb./sq. in. This was considerably in excess of the capabilities of aircraft-fueling vehicles available at the time when the Comet was designed. The Comet's requirements however are now being met adequately by the new "Dorset" fueling vehicle, made by Thompson Bros., on a Leyland chassis to the design of the Shell Petroleum Co. Two of these fuelers have now been located at each of the transit points on the London-Johannesburg route specifically for coping with the Comet's requirements, and in practice are employed simultaneously, each delivering to one side of the aircraft through a single large-diameter hose.

The Dorset has a fuel capacity of 3,000 I.G. which its robust Pegson centrifugal pump can deliver microfiltered to 10 microns through a single hose at a rate of 200-250 I.G. per min. depending on the back pressure imposed by the aircraft. Thus two Dorsets can completely fill a Comet in 20 minutes, including coupling and uncoupling time. In practice more than 4,500 I.G. is never required and this load can be delivered in 15 mins., which means that fueling should never cause the delay of a Comet at a refueling stop. The Dorset is also fitted with the new Shell-patented pressure control valve which automatically closes when the line pressure rises to the set control value (in the case of the Comet 30 lb./sq. in.) and so protects the aircraft's fuel system from being subject to hydraulic pressures in excess of the permitted maximum.

On arrival at a fueling stop the fuel remaining in the aircraft is cold and

Air Line Pilots Association Federal Credit Union Financial and Statistical Report Aug. 31, 1952

BALANCE SHEET

Assets

	August, 1952
Loans	$270,961.82
Cash	67,984.30
U. S. Bonds	238,660.95
Furniture and Fixtures	2,986.29
Prepaid Expense & Misc.	374.32
Total	$580,967.68

Liabilities

Shares	$554,202.19
Reserve for Bad Loans	8,810.71
Undivided Profits	4,421.91
Profit	13,365.17
Accounts Payable	167.70
Total	$580,967.68

STATEMENT OF INCOME & EXPENSE
(Year to Date 1952)

Income

	August, 1952
Interest on Loans	$ 23,418.10
Investment Income	1,894.01
Other Income	69.73
Total	$ 25,381.84

Expenses

Salaries	$ 7,738.39
Office Expense	1,179.01
Educational Expense	33.74
Loan Insurance	1,290.26
ALPA Reimbursement	
Depreciation	570.92
Miscellaneous	1,204.35
Total	$ 12,016.67
Net Profit	$ 13,365.17

Statistical Information

	August, 1952
Number of Members	2,098
Number of Potential Members	10,349
Loans made since Organization (Number)	1,834
Loans made since Organization (Amount)	$1,208,347.82

therefore more dense than that delivered through the fueler's meters. When the total weight of fuel for the next stage of the journey is decided the flight engineer measures the specific gravity of the fuel in the tanks by hydometer, converts its volume into a weight, by subtraction finds the weight of further fuel required, and from the specific gravity of the fuel in the fueling vehicle translates that figure into terms of volume which can be measured by the fueler's meters. This is done to ensure that the precise weight of the fuel carried is known.

Air Traffic Control. Nowadays the high traffic densities at the big air terminals such as London Airport make the immediate handling of both take-offs and landings impossible and so all aircraft must wait their turn, at least during the busy periods of the day when the congestion is worst.

To avoid confusion and to reduce the waiting period to a minimum air traffic is controled both in the air and on the ground. Permission for an aircraft to take off is not given until it is known that the airway on which it is scheduled to fly is sufficiently clear to allow it to fly along it with the established clearance in height and distance from other aircraft. This take-off permission is contingent upon its flying the route planned and at the exact height given and no deviation from these may be made without first seeking permission whilst airborne from the Airways Traffic Controller by R/T.

Similarly, congestion over the airport by the simultaneous arrival of several aircraft is handled by accepting the first for landing approach and making the remainder wait their allotted turn by flying at different heights a circuit shaped like a race-track over some fixed point near the airport.

This is done in the case of London Air Traffic Control by making the waiting aircraft fly an exact number of minutes along the eastern beam of the Epsom radio range from the cone of silence over the range station. A Rate-I left turn (taking one minute for the 180° turn), on to the reciprocal track which is flown for the same period as the outward leg, and another 180° Rate-I turn brings the aircraft once more over the range station and completes the circuit.

The lowest aircraft in the stack makes its circuit at 4,000 ft. for westerly landings which are the most common, and at 5,000 ft. for easterly. The remainder are spaced above it at one thousand feet intervals up to 10,000 ft. Thus the Epsom stack can hold seven aircraft at one time.

The lowest aircraft in the stack is the next to land, and flies a one-minute leg in its race-track pattern in order to be ready to break away for the landing approach. The second lowest also flies a one-minute leg and those above with less immediate need for positioning fly a two-minute leg pattern which therefore take six minutes to complete. As the lowest aircraft leaves for its landing approach

each one above descends a thousand feet on the instructions of London Approach Control.

Each aircraft can, of course, hear the instructions given on VHF R/T to the other aircraft, and can readily calculate the interval before it will be on the ground. At least three minutes before the lowest aircraft is due to leave the stack it is given its range departure time and course to steer from the cone of silence. An aircraft leaves the stack every four minutes to be guided by GCA radar into position in line with the runway some 8-10 miles out and then brought down steadily with appropriate instructions to lower wheels and flaps until it is 400 yards from the end of the runway. Thereafter the aircraft makes a visual landing. Outbound aircraft use the same airway used by the inbound ones and on eastVOTE

erly take-offs their route takes them directly below the Epsom stack. This restricts their height to 2,000 ft. at this point.

Now, although the speed of the Comet is considerably in excess of other commercial aircraft and its fuel consumption is exceptionally high and irreducible even while holding at low level, it is considered neither politic nor practicable to make a special concession for it by waiving all the rules and giving it priority over other aircraft during take-off and landing.

A special procedure has accordingly been worked out which is designed to absorb in advance the normal departure delays before the aircraft's engines start up. The flight plan showing destination, estimated time of departure, heights to be flown, and airways to be used is passed via London Aerodrome Control to Airways Control at Uxbridge for approval at least forty minutes before take-off time. The captain opens a listening watch on R/T to receive ATC's clearance for the flight plan and take-off time ten minutes before starting engines. The starting cycle for the four engines takes six minutes and without further delay the aircraft taxies out taking the pre-determined number of minutes to reach the take-off end of the runway within seconds of the time reserved for its take-off.

Aerodrome Control tries to keep other taxying aircraft on the move so as to allow the Comet a smooth steady journey round the perimeter track with the minimum use of brakes and subsequent engine power to get moving again. This is yet another direction in which consideration can avoid the wasting of hundreds of pounds of fuel. With no engine run-up to do other than a quick check of the functioning of the fuel pump isolation switches before releasing the brakes, the Comet can roll straight out on to the runway and be off.

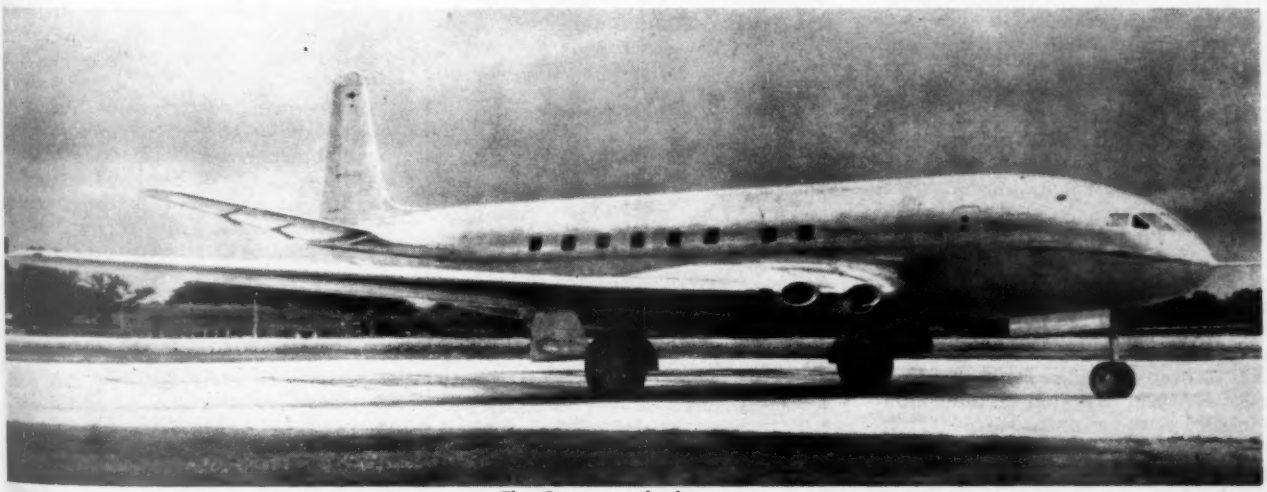
An essential feature of the economical operation of jet aircraft is that they climb as quickly as possible to cruising height, and where possible the facility is given to the Comet. However, at times when taking off towards the east with aircraft occupying the lower levels of the Epsom "stack," the Comet is held down to 2,000 ft. at this point, in itself no great hardship since Epsom is reached within five minutes of take-off. London Airways Control try to allocate the Comet a height of 4,000 ft. or more over Dunsfold and make every endeavour to allow it an uninterrupted climb thereafter until it passes out of airways control at 11,000 ft., the height above which all aircraft are under their own control.

If this is not possible, control of the Comet is passed to London Radar who identify it on their radar screens and guide it off the airways while keeping it informed of the position of nearby aircraft.

On the homeward journey across France, Paris Control pass by land line to London details of the Comet's position, height, and estimated time of arrival even before the aircraft is within VHF R/T range of London; control of the aircraft is passed to London while it is still over territory normally controled by Paris. Initial descent clearance is given over Abbeville and includes either a maximum or minimum height at which to pass over Ashford, the required height at Epsom and the landing delay expected on arrival. The Comet conforms to the normal airways route following the Amber Two Airway up to Ashford, Sevenoaks and Epsom.

The Ministry of Civil Aviation appreciates that for fuel economy and ease of handling, the overall descent path should be as even as the traffic pattern allows. Rapid descents and low altitude cruising are therefore not called for unless absolutely necessitated by the existing traffic pattern.

Rigid maintenance of heights and speeds at which to pass over the various reporting points is not required as in the case of other aircraft, some latitude in this respect being given in order to allow the Comet to make a steady descent to its allotted height over Epsom and its place in the stack. During this descent changes in the expected landing delay or height in the stack are passed immediately to give



The Comet on the line . . .

the pilot as much time as possible to alter his descent path and speed to suit the changed situation. Once in the stack, the Comet is treated like a normal aircraft and takes its turn in the landing sequence.

The following two examples taken at random show the rapidity with which events occur in the handling of the Comet and indicate the need for thinking ahead and anticipation of the requirements of this aircraft.

OUTBOUND

Time	Position	Height
13.41	Airborne London Airport.....	0
13.46	Epsom Radio Range Station....	2,000 ft.
13.50	Dunsfold Fan Marker.....	4,000 ft.
14.08	Dieppe	30,000 ft.

INBOUND

Time	Position	Height
16.21	Abbeville	29,000 ft.
16.36½	Ashford Fan Marker.....	12,500 ft.
16.43½	Sevenoaks	6,500 ft.
16.49	Epsom Stack.....	4,000 ft.

Meteorology and the Comet. The Comet is also extending the work of meteorologists engaged in forecasting weather on the routes of the commercial aircraft of the world. Up to now the highest altitudes at which commercial aircraft have regularly flown have been 20,000 to 25,000 ft. reached, for example, in the Strato-cruisers on the North Atlantic route.

So far it has been sufficient for meteorologists to prepare upper air charts to cover only the 700, 500 and 300 millibar pressure levels, which represent altitudes around 10,000 ft., 18,000 ft. and 30,000 ft. respectively. Now aircraft are beginning to fly regularly on the air routes of the world at heights consistently between 30,000 ft. and 40,000 ft., and meteorologists at civil airports along the routes from London to Africa and the Far East have had to add the 200 millibar level contour chart to the others which they draw up in order to extend the coverage for temperature, wind speed and direction forecasting up to about 39,000 ft.

Meteorologists realize that in this field there is much yet to learn and in fact their knowledge of the upper air is already being increased by the experiences of the Comet's crews. Post-flight discussions with them by the crews are therefore very much encouraged. It has, for instance, long been accepted that over Europe cloud does not extend above about 30,000 ft. However, the BOAC Comet has encountered unbroken cirrostratus at 40,000 ft. over the toe of Italy, while one pilot last year reported a cumulonimbus cloud extending up to 44,000 ft. over England. Over the tropics where the tropopause occurs at a higher altitude than in temperate zones cumulonimbus clouds frequently reach 45,000 ft. while stratiform cloud may even be found above this height.

For high altitude forecasting contour charts are drawn for several chosen pressure levels. These contour charts differ from the surface weather chart for ground and low altitude weather forecasting in that a pressure level is chosen and points at which this pressure occurs at equal altitude are joined by lines to give equi-pressure height contours, as on an ordinary topographical map, instead of joining points of equal pressure to form isobars as in the case of the surface chart. The effect is the same, however, and distance apart and direction of the contour lines give wind speeds and direction at any point as with the surface chart.

Great accuracy is required in weather forecasting for the Comet, since it is true to say that temperatures and winds, not to mention terminal weather forecasts, have a greater effect on the economics and safety of Comet operation than any other factor. Temperature forecasts have been reported to have been sufficiently good even for the Comet's requirements but accurate wind forecasting at 38,000 ft. has proved more difficult. While the high speed of the Comet makes it true to say that winds of below 30 m.p.h. have little effect upon the track made good, the wind generally encountered at the altitudes flown by this aircraft are in keeping with its own speed and may be in fact of the order of 80-120 m.p.h. while winds of 150 m.p.h. have been encountered.

Jet Streams. Although a fair amount now has been written about them no great real experience of the so-called "jet streams" has been obtained although again the increased amount of flying by Comet aircraft at altitudes in which they operate is bringing in more and more information about them. Between about 20,000 ft. and 40,000 ft. narrow currents of air about 200 miles wide and several thousand feet thick flow at high speeds of 80-200 m.p.h. in areas of very marked temperature contrast at the upper levels. These streams usually flow in a general NW-SE direction over Europe, tending to westerly in the Mediterranean, and may persist for several days in the same area wandering in position from time to time. Besides their effect on the track and speed of aircraft these jet streams display at their edges, where wind shear is high, an unusual form of turbulence resulting normally in small intensity high frequency bumps experienced by aircraft flying through this region. Jet streams, at least those encountered so far, have not proved a real hazard to Comet operations, and in fact their presence has on occasions given so high a tail-wind component as to shorten the flight time considerably.

High-level winds persisting throughout the major portions of a flight have not so far been met by BOAC Comets. Although such conditions will no doubt be encountered it may be possible to avoid the highest winds by preplanned route alterations and by operating in such a way as to give greatest altitudes since the speed of these winds tend to decrease above the tropopause, i.e. about 35,000 ft. over Europe.

This description of the way in which the BOAC Comets will be flown can give only a rough idea of the work which has gone into evolving the routines for the fast economic operation of the world's first jet-engine airliner.

You and Your Vote

● *Throughout this issue of the Air Line Pilot are scattered several reminders to VOTE. The reminders are meant for people who are falling down on the job; people who fail to take advantage of democracy's finest privilege: The privilege to select representatives of their own choice through the secret ballot.*

● *The air today is filled with charges and counter-charges of the two U. S. Presidential candidates, and the attention of U. S. citizens is attached principally upon their campaigns. In the drama of the U. S. Presidential race, lesser candidates often receive little notice. We suggest that our country's governmental system deserves more concentrated attention.*

● *There are Congressional and Senatorial representatives to be selected. Mayors, Coroners, Water Commissioners, etc., will be named. It is the duty of a good citizen to inspect the capabilities of all these candidates, and to VOTE for the ones he considers best fitted to fulfill the duties of the respective offices. The knowledge of the best candidate nor the desire to see him elected does not accomplish the fact —the VOTE does.*

● *Within ALPA you have the same responsibility. ALPA is yours. You are responsible for its actions and policies. You can control its actions and policies by exercising your right to vote. Your negligence in the exercise of your vote can mean the loss of democracy.*

Nothing has been said of the engineering side of the business. It is in fact too early to make even a preliminary comment on this aspect since with any new aircraft an assessment of its maintenance requirement can only be made after a period of intensive operation. However, the keenness and enthusiasm of the flying crews, the operations staff and the maintenance personnel of the BOAC Comet Fleet and the closeness with which De Havilland have worked with them in solving the problems posed by this novel aircraft augur well for its immediate success. The arrival of the de Havilland Comet airliner on the commercial scene is a great landmark in the history of civil aviation and the feeling of sharing in the making of history has inspired the efforts of all who have been concerned with this remarkable aircraft.

Two Alphabets . . .

ground stations' lack of familiarity with the new and the clash of various words preventing an easy flow lengthened message transmission time.

—It is operationally difficult to get specific information by the use of such key phrases as QNH (Queen, Nan, How), QFE, etc., using the ICAO version. The new alphabet lacks such smooth flowing phrases. It is difficult to replace the familiar Queen, Nan, How, with Quebec, Nectar, Hotel.

Another ambiguity arises when substituting "Romeo" for "Roger." Even-tempered is the pilot who can signify an affirmative reply with "Romeo" instead of "Roger" without calling a curse upon ICAO's house.

Words in the new alphabet do not cause an immediate recognition of the letter they represent. Examples in the old: "A" for Able, "E" for Easy, "I" for Item, "P" for Peter, "Z" for Zebra.

Added Faults in the new alphabet are pointed out by pilots. Among them:

—The words chosen for an international alphabet should be free of the possibility of slang treatment or references to regional prejudices. ICAO's bad choices: Coca, Papa, Whiskey, Yankee, Romeo, Nectar, Tango, Zulu.

—Words which contain a possible "advertising" nature should be avoided. There is no more reason for using "Coca" than there would be to use "Pepsi."

—The use of voice communications is growing, and a saturation point has been reached on certain channels. The introduction of the new alphabet, with the attendant slow down in transmission of messages, aggravates the problem of crowded channels.

—Another criticism is the fact that the new alphabet sometimes gives a humorous combination of words; subtracting from its effectiveness and dignity.

The Paradox is ICAO's insistance that its child is pure. In the eyes of the pilots the creation is blotted with errors—both of omission and commission. And stranger still is the fact that two agencies—ICAO and CAA—devoted to furthering air safety cling to the new alphabet despite the pilots refusal to accept it, and despite its glaring errors. The confusion created by an attempt to force upon pilots an alphabet which they find confusing can hardly be interpreted as a step toward "clarification."

CAA in issuing its order explained—sotto voce—that the use of the ICAO alphabet is not mandatory and that tower operators would reply to any communication regardless of the alphabet used. CAA's left-handed endorsement could be interpreted as no endorsement at all, but:

—In a business where clarity of communications is an absolute necessity, is a left-handed order pardonable?

—When the world's air line pilots have turned thumbs down on the alphabet is it in the interests of safety for ICAO to continue to push it?

Probable solution: The new alphabet will kill itself off through lack of use.

Twelve Ways to Kill an Association

(Reprinted Australian Air Pilot—July, 1952)

—Don't come to its meetings.

—If you come, come late.

—Never accept an office — it is easier to criticise than to do things.

—If asked by the Chairman to give your opinion regarding some important matter, tell him you have nothing to say. After the meeting tell everyone how THINGS ought to be done.

—Do no more than is absolutely necessary, but when other members roll up their sleeves and willingly use their abilities to help things along, howl that the Association is run by a clique.

—Hold back your subscription as long as possible.

—If you don't receive a bill for your subscription, don't pay.

—If you receive a bill for your subscription after you have paid, resign from the Association.

—If you receive service without joining, don't think of joining.

—When you attend a meeting, vote to do something and then go home and do the opposite.

—Agree to everything said at the meeting and disagree with it outside.

—When asked for information, don't give it.

Air Travel . . .

ber of pilots employed, the growth and strengthening of the air transport business in general which is certainly indicated by this latest CAA study should give all who are connected with the air transport business hope and enthusiasm for the years to come.

Aviation is a coming business. There seems to be no limit to the possibilities of expansion. Yet a chorus of discord has been sounded of late by many of its leaders concerning temporarily rising operating costs. The president of one of our largest air lines recently said for publication, "The air line industry acquired pretty full-fledged regulation very early in its life. Therefore, it is like Chinese women's feet, bound up at an early age."

A president of another equally prominent air line when asked what he intended to do with his DC-3's after delivery was made on DC-7 and Convair aircraft on order said, "My opinion is that we will have a surplus and that we will sell these airplanes to anyone who may be interested."

Contrasting to the views expressed above a colorful leader of another fast-growing air line had this to say about the purchase of jet aircraft, "I understand I may not be able to get the model I want, the Mark III, until 1957, that's no good, none at all. I have $110,000,000 worth of airplanes which I shall write off in four years. Now I want the Comet III or nothing."

The eyes of all in the industry are fixed on the future but the reaction to what they see differs—some face it with confidence, others are hesitant and mistrust change. Whatever the attitude, it is almost as well to be forewarned as to be forearmed for if we have some knowledge of what lies ahead, we can more wisely pattern today's conditions so as to dovetail more smoothly with the changes that will certainly come.

To All Scheduled Airline Flight Personnel:

The Franklin Life Insurance Company, a billion dollar institution, is proud to have been a pioneer in providing standard life insurance protection to all employees of scheduled airlines. It is currently the only company that will issue standard, unlimited and unrestricted coverage, regardless of residence, travel or occupational duties.

We offer other advantages under our favorable Salary Allotment Franchises which, in addition to giving the policyholder the convenience of premium deposit by payroll deduction, also gives the advantage of the annual premium divided by twelve, instead of charging the regular monthly premium, which is approximately 6% more than the annual premium.

At present we have Salary Allotment Franchises with Pan American World Airways, Braniff, Panagra and several others. We are now in a position to offer this convenience and savings to all other scheduled airlines.

In addition to providing attractive Annuity and Educational Endowment contracts, The Franklin makes it possible for scheduled airline pilots who are interested only in low-cost protection, to buy full coverage life insurance at the following monthly rates per thousand:

Age 20—57c	Age 35—89c
Age 25—65c	Age 40—$1.07
Age 30—75c	Age 45—$1.40

(These premiums will be reduced materially by annual dividends after the first year.)

The Wright Agency, Airline Div.

158 Valencia Avenue
Coral Gables, Florida

The Franklin Life Insurance Company

Springfield, Illinois